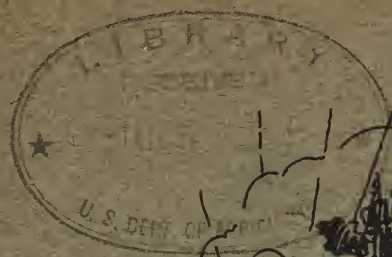


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THE LAND

TODAY AND TOMORROW

OCTOBER
1934

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SOIL EROSION SERVICE
U.S. Department of the Interior

THE LAND

TODAY · AND · TOMORROW

Issued Monthly by the
U. S. SOIL EROSION SERVICE
Department of the Interior

Harold L. Ickes
Secretary of the Interior

H. H. Bennett
Director, Soil Erosion Service

G. A. Barnes

Ewing Jones

EDITORS

By direction of the Secretary of the Interior the matter contained herein is published as administrative business and information.

PRE-THOUGHT

Inspired by the vision of an earth always good and always bountiful, we build upon today the bulwark of a better land tomorrow.

We are the vanguard in an epic stand against the elements. Something of the pioneering spirit that forever seeks a fertile land must sustain us if our common goal seems sometimes far away. Always, we must look ahead.

If "*The Land: Today and Tomorrow*" can carry forth from time to time a message of encouragement; if it can solidify our common bond; if it can crystallize the objective toward which we strive; --- then will it have fulfilled the ends to which it has been dedicated.

PROJECT WORRIES

The Navajo



Here is a good shot of the Oraibi Wash, largest of the many scourges On the Navajo reservation. Once prolific fields of corn grew along here; now the wash is about 75 to 100 feet deep, and that many miles long.



Sidewash along the Rio Puerco of the West, near Gallup. Asst. Regional Director P. D. Matthews is in the picture. This land is irrevocably ruined.

A Major Effort at Erosion Control

By H. H. Bennett
Director

*Wherein are set forth our
common objective and the
need for real cooperation
if our job is to be well done*

Slightly more than a month ago, on Sept. 20th, the Soil Erosion Service passed the first anniversary of its creation. In one year it had grown with amazing speed from a nebulous plan into a well-knit organization of surprising size and scope. Now, as we enter our second year, it seems appropriate to pause for a reconsideration of our aim, a recapitulation of our accomplishments, and a look ahead.

During the latter part of 1933 the Soil Erosion Service was set up as a branch of the Department of the Interior, with an allotment of \$10,000,000 from the Public Works Administration. Its purpose was to demonstrate the practical possibilities of curbing erosion and its allied evils of increasing floods and costly silting of stream channels, irrigation ditches, and reservoirs. The demonstrations were to be made within representative watersheds of the various important geographic and agricultural regions where the evils of erosion are known to constitute major problems in connection with the use of the nation's resources of land and water.

The general plan of procedure, as suggested by the President and carried out by the Soil Erosion Service, is to treat complete watersheds within which the principal regional types of soil, average topographic conditions and representative systems of agriculture are found. The individual size of these watersheds, of which 31 are now under treatment in 30 states, ranges from about 25,000 to 200,000 acres. The project on the Navajo Indian Reservation in Arizona, New Mexico and Utah involves 16,000,000 acres; the Gila River watershed project comprises something over 8,000,000 acres. Altogether, the Soil Erosion Service is now actively engaged in combating erosion and its associated evils on approximately 28 million acres of land.

PLAN OF PROCEDURE

The method of attack is essentially a coordinated plan of correct land use. This plan involves not only the use of direct methods of retarding erosion (which necessarily calls for retardation of runoff by increasing absorption of the rainfall), but the use of indirect methods, such as retirement from cultivation of steep, highly erosive areas from which accelerated runoff (resulting from incorrect land usage) descends with destructive effect upon lower-lying lands. Such critically vulnerable lands are being planted with thick-growing, soil-holding crops, such as trees, grass, alfalfa, lespedeza, sorghum, and clover.

This initial program calls for the use of all known measures of erosion control. In some instances, however, some experimental work must be carried out in order that definite data can be obtained for application to those soil and land conditions that have not been previously studied, but which present serious erosion problems. It is the definite aim of this Service to develop efficient practical erosion control programs for the different broad land regions and to work out a national policy of soil and water conservation based on correct methods of land use, so that the program can be extended as speedily as possible to all eroding farm lands.

Such a comprehensive setup must embody a coordination of the work of all agencies equipped to make a constructive contribution, especially the Extension Services and the Colleges of Agriculture. There must also be a purposeful, sympathetic cooperation between the farmer and the directing agency. Such a relationship is vitally essential for successful procedure in any effective program of control, which almost invariably will involve rearrangements and revisions in cropping and tillage practices, farm management and land use; and it meets fairly our traditions of property rights in land and at the same time supports the new concept that the public good calls for public participation in the tremendously difficult field of conserving our indispensable national resource, whether the land be public or private.

The moderately sloping lands which constitute the larger percentage of our cultivated farms present the most difficult job of all. Here there is always impoverishing sheet erosion wherever sloping land is devoted to the clean-tilled crops, with frequent gullying where the absorptive topsoil has been removed. Corrective methods necessarily will call for crop rotations, strip-cropping, terracing, careful land use based on soil suitability, and often rather marked changes in cultural practices, such as cultivation on the contour, rather than down the slopes.

Every farm is surveyed in advance of actual work, by specialists of the local erosion staff. Soils, slopes, extent of erosion and plant cover are plotted on an accurate map. With the aid of this, the farmer and the erosion specialists go over the farmstead, study it in detail on the ground (not about an office table), and plan a course of procedure by assigning each acre or each piece of land to a particular use, in accordance with its characteristics, adaptability and appropriate place in a carefully planned, coordinated land-use program for that particular farm. The work is carried out on a strictly cooperative basis with the farmers.

Generally the farmers are enthusiastically supporting every phase of the program. On some of the projects more than 95 per cent of the farmers directly affected are going along with the program of the erosion specialists, agreeing to far reaching reorganization of their fields and farm procedures. For example, on numerous farms fences are being relocated so as to permit contour cultivation, terracing, strip-cropping, the inauguration of soil-building rotations and the planting of the more vulnerable slopes to grass, trees, etc.

Such hearty cooperation, it is believed, insures the success of the program. By putting through these initial educational watershed projects in a highly impressive manner, it is felt that it will then be possible to extend the work to all areas needing treatment through the activities of the Soil Erosion Service, the Extension Service, the colleges of agriculture and other pertinent organizations.

THE CHALLENGE

The call for control of erosion is not a challenge to technical men to work out methods that will permit farmers to continue any and all farm practices and land uses that they may elect to follow, from choice, tradition, or habit. Rather, it is a challenge to definite certain basic principles in practical land utilization and crop adaptation that will meet the problem and then secure, upon a

strictly cooperative basis, the farmers' acceptance of the principles and practices in his farm management program. We can not go far unless we can control land abuses. Customary farm practices are not sufficient to prevent destructive erosion. Revisions and adjustments must be made on most farms if we are to inaugurate a program that will prove adequate and effective in controlling land wastage from erosion and make possible a surer and more stabilized farm prosperity.

Such a revised plan of farm operations will embody those beneficial and proven ideas that agricultural leaders and governmental and state agencies have been urging upon the farmers for years, in their separate and detached ways. But this time these ideas are combined in a coordinated program that will rest squarely upon the fundamental physical factors of soil erosion control as determined by research and practical farm tests.

Such a program, then, must include a definite plan to be followed in all cropping and land use, in order to achieve a three-fold objective: (a) a beneficial re-cast of farm set-up and practices so as to bring about a more dependable and permanently profitable farming enterprise for the individual, (b) the control of soil erosion and land wastage in a permanent way, and (c) the minimizing of flood and water hazards and stream-channel and reservoir sedimentation with the products of erosion.

The unit area of control is the individual farm. Each land owner in the selected watershed is being urgently invited to participate in and cooperate with the general program. Participation is based on an agreement with the Government to perform certain specified essential work on his farm under direction of the local technical erosion staff, the farmer agreeing to maintain in effective and continuous operation for a period of five years all installations affected under the agreement.

FIRST COORDINATED EROSION CONTROL EFFORT

Here is the first attempt in the history of the country to put through large-scale, comprehensive erosion and flood control projects, applying to complete watersheds from the very crest of the ridges down across the slopes to the banks of streams and thence to their mouths. These are not engineering projects or forestry projects or cropping projects or soils projects or extension projects, but a combination of these, with other specialized activities where needed, operated conjointly with such reorganization of farm procedure as the character of the land indicates as being necessary. This procedure is based on the best information in the possession of scientific agriculturists:--the agronomist, forester, range specialist, soil specialist, erosion specialist, agricultural engineer, economist, extension specialist, game specialist, geographer and others. It is the application of accumulated knowledge pertaining to the great multiplicity of variables affecting the three-phase process of absorption, runoff and erosion, employed not as single uncoordinated implements of attack, but collectively, according to the needs and adaptability of the land, in a combination of integrated control measures, to be supplemented where necessary by new information accruing from the experience of combat.

No such coordinated attack has ever before been made against the evil of erosion in this country. Considering the physical factors involved, it should be definitely obvious to any one that there is no other possible practical method of ever making any effective, lasting headway against this vicious problem. Even if the Government owned the land, it would still have to be used over large areas in the production of crops and for grazing, and here again precisely the same physical problems would have to be met and conquered, an eventuality that unavoidably precedes all other considerations relating to correct land use.

CONTROL OF EROSION AN UNAVOIDABLE NECESSITY

Control of erosion is the first and most essential step in the direction of

correct land utilization on something like 75 per cent of the cultivated (and cultivable) area of the nation. If the soil is permitted to wash to a condition equivalent to skeletonized land, as has already happened over something like 35 million acres formerly cultivated, there will be nothing left to save. Failure to curb this insidious process will effectively and disastrously take care of all aspects of the land problem in numerous localities, both physical and economic; and after this deluge of waste, nature, in numerous instances at any rate, can do as good a job as man toward rehabilitating these hopelessly devastated areas. But nature's is a slow process.

It seems scarcely necessary to add that whatever our inclinations may be, whatever opinions, conclusions or complexities our round-table, institute and academic discussions may lead us to, here is a physical job--the job of curbing erosion--that must be performed if the nation is to avoid early arrival at an inconceivably bad land situation.

The Union of South Africa has reached this conclusion and is now busily engaged in an attack against the devastating erosion of that country, employing a plan of procedure very much like that developed by the Soil Erosion Service. The Italian Government is engaged in an enormous land reclamation and conservation program--the Bonifica Integrale--at a cost of \$500,000,000. Japan for many years has been spending many times the value of numerous critically eroding areas in order to protect indispensable valley lands from the silt issuing from such sore spots. The United States can no more afford to neglect any further this gigantic problem of waning soil productivity than South Africa or Japan or Italy, for the very simple reason that we are depleting our farm and grazing lands at a rate probably exceeding that taking place on any other important part of the globe.

NO OTHER WAY OUT

This job we are engaged in must be carried through to completion. The physical facts involved show conclusively that there is no other way out if the agricultural lands of the nation are to be saved.

Long ago we were warned about the evil of erosion by Washington, Jefferson, Edmund Ruffin, Shaler and others. What has been the answer? Definitely, the answer is that regardless of these warnings erosion has been permitted to continue in this country, not merely progressively, but at an accelerated rate. To be sure, valiant attempts to control the evil have been made locally; and in many areas, particularly on gently sloping land, the problem has been pretty well solved. But much of our effort--an effort pitifully small considering the nation as a whole--has come to a disastrous end. This is because we have made the mistake of trying to curb the most powerful physical agency that affects the character of the earth's surface, except sunlight, with a single implement of combat, used too frequently with little regard for adaptability, as determined by the character of the land.

Now that we have mapped as much as a hundred thousand acres of land in a single country hopelessly eroded, though every acre had been treated according to this single-track method of erosion control, it would be as unpatriotic as it would be obstinately foolish to cast aside what research and study have shown us to be the only possible road to success. We must make use of all our accumulated information, all of our implements of attack, according to need, in controlling this agency which, across the centuries, has built up approximately seven-eighths of the area of the nation through processes of tearing down, transportation and sedimentation. Of course, we are not immediately concerned with this slow geologic norm of erosion, but it is important to know that even this slow process is a prodigious tool of land sculpture.

Continued on Page Twenty

Some Necessary Distinctions In Land Use Problems

By W. C. Lowdermilk

VICE-DIRECTOR

In launching the service bulletin "The Land: Today and Tomorrow", I am constrained to believe that an important event has taken place. Who knows the extent of the growth of this modest internal organ of the Soil Erosion Service? Who knows how its influence on the thought of people concerned with conservation of basic resources of the soil will develop? It may become an instrumentality for furnishing the bases for policies in the management of land resources that will have far reaching influence upon the maintenance of land productivity for generations to come.

Whatever the distant future of the venture now entered upon, we can expect that "The Land: Today and Tomorrow" will contribute to the solidarity of the aims and function of the Soil Erosion Service: it will serve to keep our personnel informed of the various activities of other members of the Service. It will make each of us realize that we are working together in a program which is fundamental to the maintenance of civilization.

A civilization cannot continue to develop on the destruction of the productivity of its basic soil resources. It is necessary at this point to make such distinctions between depletion of soil productivity resulting from the consumption of plant nutrients within the soil by plants, and the destruction of the physical body of the soil. Too often a confusion exists in the evaluation of causes of reduction in crop production. Such confusion militates against sound program of land use planning. The consumption of plant foods by crops is essentially the operation of an agricultural factory. The soil and climatic temperature and moisture supply comprise the factory. This factory is, however, a delicately balanced complex of physical, chemical and biotic elements which need not be enlarged upon here. The plants are the factory machines, and the plant foods within the soil are the expendable materials employed in the production of crops. Plant foods as fertilizers may be replaced in the soil factory, and production thus becomes a venture to be managed on economic principles.

Destruction of the physical body of the soil by accelerated erosion is quite another matter: it involves wrecking the factory, often beyond repair. Accelerated, or man induced, erosion may so wreck the factory for agricultural crops that the factory site must be abandoned. From this point on our analogy begins to fall down, but it is sufficiently valid to emphasize the dangers of confusion in considering the processes involved in the reduction of land productivity.

Cropping of land may become unprofitable from a number of causes, which may be divided into two major groups, (1) economic and (2) physical. Economic factors are relative and depend upon transportation facilities, price changes, changing demands responsive to movements, and increases or decreases of population. Physical factors represent the fixtures of the country, including climate, topography, and soils. The soil is the factor subject to modification and damage by human occupation. With the soil are bound up conditions affecting absorption of rainfall, runoff, and soil erosion, and sedimentation in flood plains and in reservoirs. To

save the soil saves conditions essential to continued maximum productivity of lands and beneficial utility of waters. The first requisite, therefore, is to safeguard the physical elements of our factory of agricultural production. Having done this there is left to this and future generations the freedom of choice in the use and development of land resources. With the destruction of the physical body of the soil, on the other hand, goes a loss of liberty of action in the use of a basic resource. The consequences affect not only the economics of land use but the maintenance of resident populations.

The Soil Erosion Service, therefore, has for its major function the establishment of erosion control demonstration areas representative of regions of critical soil wastage resulting from accelerated erosion, and to carry out on such areas a well-rounded, coordinated program of erosion control through suitable measures involving correct land use. To fulfill this function there are being made erosion surveys, and investigations to establish necessary information on the problems of soil erosion as it affects regional and national welfare. The needs of the land determine the measures and practices to be followed.

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DR. A. H. MEYER PASSES AWAY

Dr. A. H. Meyer, regional director of the Soil Erosion Service projects at Minden and Ruston, Louisiana, died Saturday, September 15, as the result of injuries sustained in an automobile accident. Although apparently not seriously injured, Dr. Meyer succumbed twenty-four hours after the accident. He was buried at College Station, Baton Rouge, Louisiana, September 18.

Director Bennett's tribute is representative of the feeling of all who knew Dr. Meyer. Said Mr. Bennett: "I have known and worked with Dr. Meyer many years, as have a number of others of the Soil Erosion Service staff. We knew him as a highly capable man, a diligent worker, and a most agreeable friend. His passing means the creation of a gap in our work and lives--a gap that will be difficult indeed to cross."

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DIPLOMAS GIVEN CCC GRADS

"By this all will know John Doe served his country well as a member of the Civilian Conservation Corps and engaged valiantly in the national struggle to preserve our lands and farms, and that with all honors he completed his tour of duty at Smithville, N. S., on ---- 1934."

Appropriately designed and officially signed copies of diplomas bearing the above description are in the future to enrich the possession of all CCC workers honorably discharged from the Soil Erosion Service. Ten thousand two hundred of these diplomas were recently mailed from the office of J. G. Lindley, Supervising Engineer, to the erosion camps.

It is as a mark of appreciation of services in the battle against erosion Lindley said, that the diplomas are tendered to men deserving them.

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In Prospect

By Charles W. Collier

SPECIAL ASSISTANT TO THE DIRECTOR

Satisfied that the Soil Erosion Service is obtaining results of lasting benefit in its fight against erosion, Secretary of the Interior Harold L. Ickes recently has made available an additional ten million dollars from the Public Works fund for the purpose of expanding the Service's frontiers of combat throughout the nation.

Announced in two five million dollar allotments, the new allocation brought to twenty million dollars the total thus far turned over to the Service for prosecution of its vital program of soil conservation.

News of the Secretary's action was the signal for an intensive effort to expand the program in accordance with his wishes. Director Bennett immediately began investigations to determine where the Service might locate new demonstration projects with benefit to the widest possible number of people.

As this issue goes to press, eight new projects have been formally set up in various sections of the country, some as independent projects, others as extensions of projects already under way. Together these new undertakings cover a total of 8,681,000 acres and have received allotments of funds aggregating \$4,335,000. Other new areas are being announced as rapidly as preliminary studies requisite to judicial selection can be completed.

First to be created under the additional ten million dollar fund was the Root River project in southeastern Minnesota, just across the Mississippi from the Soil Erosion Service project on Coon Creek, Wisconsin. The area selected covers 150,000 acres of land typifying some twelve million acres of surrounding country. R. H. Davis, Regional Director at Coon Creek, who is also to direct the Root River project, was advised by Mr. Bennett on September 21 that an allotment of \$300,000 had been made for the Minnesota work. He is now proceeding with the selection of personnel and other matters incident to the launching of actual work.

On September 28, with the approval of Secretary Ickes, Mr. Bennett announced the allotment of \$200,000 for an extension of the North Carolina erosion control program to include 44,000 acres in the watershed of the Haw River. Work in this additional drainage area will be under the direction of Dr. J. H. Stallings, Regional Director of the Deep River project at High Point, North Carolina.

An entirely independent project, covering 115,000 acres of land in central Pennsylvania was established by Mr. Bennett on October 5, with an allotment of \$200,000 from the new PWA funds. Dr. Austin L. Patrick, who has had charge of the soil erosion experimental-survey project at State College, Pennsylvania, was named Regional Director, and will set up headquarters at Indiana, Pa. The area selected for the demonstration work embraces the watershed of Crooked Creek, about 90 miles from Pittsburgh, and is representative of approximately 1,728,000 acres in the central portion of the state.

Expansion of the program in South Carolina was authorized by Mr. Bennett on October 5, when he announced the allotment of \$150,000 for a demonstration project covering 50,000 acres in the watershed of Fishing Creek. The work in

this new area will be under the direction of Dr. T. S. Ruie, Regional Director of the South Tiger River project at Spartanburg.

On October 7, the Director announced an allotment of \$250,000, since increased to \$500,000, for active prosecution of the gigantic erosion control project in the basin of the Gila River in New Mexico and Arizona. The program contemplated for this \$2,200,000-acre undertaking represents one of the most comprehensive land utilization projects ever attempted, involving a complete and coordinated system of erosion control, flood prevention, forestry management and range regulation. It will be carried out in close cooperation with the United States Forest Service, the Office of Indian Affairs, and the grazing authority created under the Taylor Grazing Act.

Major B. P. Fleming, Chief Engineer of the Soil Erosion Service, has been acting Regional Director of the Gila project for some time, supervising the work being done there with CWA and CCC labor. He will continue in that capacity indefinitely, directing the organization and launching of the vast program now authorized.

An allotment of \$70,000 for establishment of the first wind erosion control project ever undertaken in this country, was announced by Mr. Bennett on October 9. This unique demonstration will be located at Dalhart, Texas, in the heart of the Panhandle region which suffered so heavily during the intense drouth of last summer. Mr. R. H. Finnell, agronomist of the Oklahoma State Experiment Station, has been named Regional Director.

Another independent project was established by Mr. Bennett on October 11 with the allotment of \$200,000 for a demonstration program covering 75,000 acres in northern New Jersey. The area selected is only 40 miles from New York City and forms an important source of supply for the milk and vegetable markets of the nation's great metropolis and other cities in the thickly populated sections adjacent to it. No Regional Director has yet been formally appointed for this project. Dr. L. L. Lee, land and soils specialist of the New Jersey College of Agriculture at Trenton, conducted the preliminary surveys and submitted the report upon which Mr. Bennett based his decision to go into the state.

Projects in California, Maine and a number of other states are under consideration, but have not yet been announced.

Through these new projects, we carry forward our frontier in the struggle to save the land. Through them we will dramatize the situation in new regions, just as we have dramatized it with our other regions where now we are well established. Through them we will educate public opinion and lay the foundation for an effectively expanded program which must surely be set up within the not very distant future.

If our program succeeds,--- and it will,--- we will have done more towards insuring a permanently prosperous civilization in the United States than almost any other agency ever created. For every civilization is utterly dependent for existence upon the productivity of its agricultural lands.

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When Harry E. Reddick, Regional Director of the project at Santa Paula California, decides to go over the area he does just that. Reddick is a licensed airplane pilot and owns and operates a plane.

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STRIP-CROPPING
and
ITS RELATION TO FARM TERRACING

*by Ernest Carnes
Spartanburg Area*

Most of us who have been working with farmers for a number of years know that it is not the best policy in most instances to recommend drastic or sudden changes in the fundamental system of farming. Therefore, it is recommended that the following outline be followed in the determination of a strip cropping program:

1. List the crops grown in area and percentage of acreage of each compared to total crop acreage.
2. Classify these crops as erosion resisting or not.
3. List other crops that are not generally grown in area, and that should be grown to develop a better cropping system, and assist in erosion control.
4. Determine which of the erosion resisting crops that are being grown, or to be grown, make their maximum growth or development concurrently with the usual maximum rainfall.

When these facts are determined the general program of strip cropping or strip-rotation may be formulated, leaving of course many details to be worked out for each individual farm.

In the South Tyger River area we find that cotton and corn are the two principal clean cultivated crops and these two crops combined represent about two-thirds of the cultivated acreage. We also find that the grain, oats, wheat, barley and rye, represent about one-fourth of the cultivated acreage, and on the remaining acreage are planted such crops as sorghum, cow peas, soy beans, alfalfa, etc.

The grain crop makes its maximum growth, or approximately so, near the time when the heaviest rain or greatest precipitation occurs, namely, in the spring months. Therefore, it is not difficult to decide that the grain crops are the logical ones to be used as the basic or principal strip crops.

Recently a large number of objections to the narrow strips have been made by cooperators and many non-cooperators said they would not join in the program of erosion control, if narrow strips were required. The general complaints raised were, that the strips were too narrow to be harvested very successfully with machinery without interfering with cultivated crops, and that the narrow strips caused "patchy farming", requiring more effort in cultivation and harvesting. Another objection was that the large number of strips resulted in more border rows of cotton and corn, which reduced yields.

By this time, we had studied the problem more thoroughly and had already decided to recommend a decided change beginning this fall, using the grain crop as the fundamental strip crop, supplementing this with lespedeza or sweet clover, sowing these crops on that portion of the grain crop not needed for summer hay. In addition, some semi-permanent strips of Serecia and alfalfa are being grown.

When terraces have been newly built in late fall, winter, and early spring, the strip crop program for the current summer will be to plant each

terrace ridge to some crop such as cowpeas, sorghum, sudan, or a mixture of sorghum and cow peas. This will furnish protection for the newly built terrace and permit the ridge to become well stabilized, raising the seep line before the rainy season the following winter and spring.

The above program is probably not the ideal or most efficient, but who knows what is ideal? Too, we have the promise of the farmer to adopt this system of strip rotation, beginning this fall. To a great extent, we are using the crops the farmer is already growing and know how to grow, but we are simply rearranging these crops in such a way as to greatly lessen erosion on his farm.

It is true we are attempting to change to some extent the cropping plans, but only in minor detail. For example, we are getting farmers to plant more oats and barley and less corn on these red hillsides. We have less failures with oats and barley compared to corn as the grain ripens in the spring when we usually have plenty of moisture. More grain planted results in less erosion. Too, we are introducing lespedeza and sweet clover as a supplement to grain as strip crops. These are new crops for this area.

There are now many discussions about strip cropping, or vegetative control and farm terracing. My personal opinion is that one is just as important as the other for this project area. Practically every farm in this area has some type of terraces on every hillside, yet erosion is taking place at an alarming rate. We must state that probably 75 per cent of the existing terraces are improperly run and built. They have entirely too much fall or grade, resulting in severe erosion, especially near the outlets. Undoubtedly much valuable soil would have been saved if farmers years ago erected and maintained the best known system of terracing.

It is evident that most of the soil loss from any given slope takes place during some extraordinary condition. This condition may happen only once or probably twice or three times during a twelve months' period when a very heavy rain takes place in a very short period of time, and especially if the slopes have no vegetative protection during such a time. No system of terraces is perfect and they are likely to break at just such a time. If the field in question has bands of close-rooted crops growing or present when the terraces break, much valuable soil will be saved. It is entirely possible that the terraces would be prevented from breaking if the strips were present and all the slope was not plowed at any given time. Even if an efficient system of terraces are constructed, strip cropping is equivalent to a good insurance policy kept in effect.

Assume that a system of terraces will be constructed on the project areas that will hold under any condition. It is reasonable to believe that it will be some time before all the rest of the hillside farms will have such a system of terracing. It is understood that the project areas are to serve as models in erosion control for the rest of the country. Therefore, strip cropping or strip rotation should by all means be put into effect in conjunction with terracing. We could hardly justify the expenditure of public funds on project areas if it were not for the fact that these large-scale demonstrations are to show the rest of the country how best to do the job.

Therefore, until more research information is available, we believe that both terracing and strip-rotation should be practiced, especially on the project areas.

WORK GOES ON AT ALBION

This is the first of a series of articles describing the various projects and their problems. In this article by Regional Director R. L. von Trebra, an optimistic note for the future is sounded.

The Nebraska area, Soil Erosion Service, started the first actual field operations May 14. This work consisted of gully control activities and all the labor was done by CCC enrollees. By June, the signing of co-operative agreements and the agronomic work in connection therewith was getting under way in good manner. By July 15 construction work with terracing machinery was started.

In the Plum Creek project, which is composed of approximately 70,000 acres, there are in round numbers 300 individual farms. On October 1, 136 cropping systems had been planned on the same number of farms. These cropping systems covered an area of 28,931 acres. Out of a total of 136 cropping systems that had been planned, 105 cooperative agreements were signed, which included an area of 22,304 acres. In the 22,304 acres that were signed up and covered by cooperative agreements, 3,014 were taken out of cultivation for the purpose of seeding to pasture grass mixtures or alfalfa. We have, out of the signed acreage, 4,751 acres now in pasture grasses or alfalfa. We now have a combined total of 7,761 acres of the total signed acreage that will be taken completely out of cultivation or remain out of cultivation. This is approximately 35% of the total contracted acreage and represents the steeper, more seriously eroded land of the farms that have been signed up. Many fields that are now in cultivation and that contain slopes varying from 7 to 20% are being removed entirely from cultivation, and being seeded to grass or alfalfa.

In the Plum Creek area the program of erosion control that will be employed on practically all farms will embody almost all phases of erosion control activities. These various phases are gully control, tree planting, re-seeding of eroded slopes and gully banks, contourcultivation, contour cropping, and permanent contour strips of grass. Almost every farm will of necessity have to have complete rearrangement of field boundaries based on contourlines or terraces.

The soil in the area is of one general type. It is a deep loess and belongs in the Marshall or Knox series. Much of the land is very rough and rolling, and is subject to severe sheet and gully erosion. The land itself is very productive, but where severe sheet erosion has taken place there is a marked reduction in yields. Farmers are following a general practice of growing corn two or three years, followed by oats and sweet clover. Regardless of the amount of surface soil that has been lost through erosion, it is not difficult to secure good stands of sweet clover on this particular soil type. When sweet clover is plowed under in the summer of the second year, a large amount of vegetative growth and plant food is turned under that has an immediate effect

on the following crop which is usually corn. For this reason it is difficult to get many farmers to realize the devastating effect that erosion causes.

There is one phase of erosion that is becoming quite serious that the farmers admit their inability to cope with, and are very willing and glad to have the services of the Soil Erosion Service in combating. This is gullying, and to drive over the area, and to note the seriousness of gully formation, it is easy to realize that this one phase of erosion has gotten completely beyond the control of the average farmer. It has threatened the very foundation of his farm value, and in some cases gullies are threatening the complete destruction of his farm yards and buildings. When gullies form in the soil type found on the Plum Creek project, they produce deep narrow gulches with vertical side-walls, and the gully becomes a serious menace to farm operations, pasturing of live stock and threatens the destruction of the entire farm if left uncontrolled.

Engineering principles employed on the project are the construction of interception ditches around the heads of many of the gullies, grading down the gully banks, and the construction of brush and wire dams in the bottoms of the gullies in order to stabilize them until such time as tree growth and vegetative covering tends towards a stabilized condition. On the tillable farm land level terraces are being constructed wherever terraces can satisfactorily be constructed as regards degree of slope, use of land, and the condition of the erosion taking place thereon. The terraces, besides acting as an interceptor of surface runoff, and storing a large quantity of water that falls, will also act as a guide in contour cultivation, and very often will serve as a means of using a contour field boundary on natural lines.

Since July 15, 451 terraces have been built with two elevating graders working, and have a length of 102 miles. The actual acreage protected adjacent to the terraces amounts to 3,600 acres. It is not expected to use terraces in this area as a permanent means of erosion control, but besides preventing soil losses by slowing up the runoff, a large quantity of rainfall which otherwise is lost will be stored and allowed to penetrate the subsoil. In some respects moisture conservation as well as soil conservation is a very important factor in this region, where the average rainfall is less than 26 inches, and at times is far below normal requirements during the growing season.

In the gully control operations which are done entirely by CCC labor, 1145 brush dams have been constructed up to October 1. 273 single post wire dams and 164 double post wire dams have been constructed. On both of the wire dams, straw and trash, together with large quantities of brush are used in constructing the core of the dam and the apron. Around the heads of gullies on the contracted acreage 38,343 feet of interception ditch has been built. The purpose of the interception ditches are to take the water out of the gullies and carry it around the sides and on to more gradual slopes where it can be dispersed in a thin sheet, and the cutting effect of water in a concentrated form be diminished as much as possible.

At this time we have definite plans made for 433 acres of strip cropping and 57 farms on which 559 acres will be permanently protected with permanent grass strips. We expect in addition to this to employ strip cropping on every farm possible. At the time that the cooperative agreements are signed, definite plans for rotations, strip cropping, and the like cannot be made until after the engineering phases of the erosion control program are completed. We know that it will be necessary to make rearranged fields and to even set up different rotations than those shown on the contract maps.

After the engineering features, such as gully control activities and terracing, have been placed on the farm, it will be much more satisfactory to use the contour field strips and the contour strip cropping plans because it is felt that all such phases of cultivation and erosion control operations are based primarily on contour methods that of necessity have to follow survey lines that are laid out by the engineers.

The program that is being worked out for erosion control on the Plum Creek project and the complete change in farming operations that from necessity will have to follow is such a revolutionary change from the present methods of farming that some farmers object strenuously to the idea of contour cultivation, strip cropping, and terracing. Gradually the objections are being overcome as the farmers become more familiar with the work, and the principles on which it is based. The farmers are gradually beginning to realize that erosion is a problem to which they must give more careful attention in the future, and when once they see it in such a light, their cooperation in the program is not so difficult to secure. Many of the farmers are primarily interested at this time as much or more in the conservation of moisture as they are in the conservation of soil. Fortunately the two are so closely correlated and go hand in hand, and the principles that bring about the conservation of one bring about the conservation of the other.

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CORN SURPLUSES AND SOIL EROSION

by C. Reed Hill
Extension Agent, Bethany

Corn surpluses are caused in large measure, by the impoverished acreages. Each agricultural community has what it considers its "cash" crop. The acreage in this crop is increased to offset decreased yields and low price. Soil building investments have been cancelled out in their net effect by erosion.

The "cash" crop for the Bethany project is corn. Our emphasis on crop rotation and the retirement of submarginal corn acreage from production is, in its final analysis, a direct attack upon the contribution of this community towards a corn surplus. The following table shows the relationship between low yields and total production:

LOW ACREAGE YIELDS INCREASE TOTAL CORN PRODUCTION

	<u>YIELDS</u>		
	<u>Low</u>	<u>Medium</u>	<u>High</u>
Yield, bushels per acre	25	40	60
Value per acre @ 45¢ per bushel	\$11.25	\$18.00	\$27.00
Average operating cost, per acre	9.00	10.00	11.00
Net return, per acre	2.25	8.00	16.00
Acrea to yield \$600 net return	266.6	75.0	37.5
Total production, bushels	6666	3000	2250

The farmer who is leaving the soil of his farm get away from him and who has not systematically built up the soil fertility, is producing 6665 bushels of corn to get that \$600 which we have considered as the minimum "cash" income to a farm family. Some of the more erosive slopes of his farm now in corn are not even paying operating expenses.

As the yield per acre increases in net returns the total production per farm decreases, if the demand for cash is kept reasonable. The medium-yield farm produces about 45 per cent as many bushels of corn as the low-yield farm to get that necessary \$600 "cash" family income. Our problem is much more important between the low- and medium-yield farms than between the medium- and high-yield farms.

The foregoing table also brings out the relationship between selling price and soil productivity. Twenty-five-bushel land demands a 36-cent per bushel price to meet operating expense, while sixty-bushel land covers operating expenses at half this price - 18-1/3 cents.

A correlated attack of the soil erosion problems of an individual farm will do permanent good in remedying our crop surplus problem. Our activities are not in opposition to those of the United States Department of Agriculture, which is energetically wrestling with this surplus problem.

Any of our analyses which fail to get down to dollars may have a hole punched into them some day.

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COON CREEK PROJECT EXHIBITS "BEFORE AND AFTER" FARM MODEL

At the Tri-State Fair, held at La Crosse, Wisconsin, September 18-21, Chief Agronomist I. K. Landon, of the Coon Creek project, exhibited a miniature model of a farm before and after treatment by the Soil Erosion Service. On one side of the booth was shown a farm in its condition before the Soil Erosion Service undertook its reorganization, with denuded overgrazed hillsides, unprotected cornfields, and the consequent damage from sheet and gully erosion. Adjoining on the other side of the booth was a model of the same farm as laid out by the erosion specialists, with terraces, protected terrace outlets, strip-cropping, fenced and planted hillsides, protected stream banks, and food patches for wild life. To further show the effect on run-off made by the operations of our technicians, the models were from time to time sprayed with water.

This exhibit attracted so much attention among the farmers coming to the fair that Mr. Landon, who was in attendance at the booth to explain the model, reached home so hoarse every night that he couldn't talk back to his wife when scolded for being late for supper.

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DROUGHT HAMPER'S TEMPLE PROJECT

The planting of erosion-resisting vegetation on the Temple, Texas project has been greatly hampered due to the fact that no rain of any consequence has fallen there since early in April. A grass multiplication nursery, consisting of fifteen acres of irrigated land has been acquired, and planted to various grasses which are obtainable only in small quantities, or that have to be transported from distant points. The principal species planted are *Paspalum dilatatum* (Dallis grass), both seed and sets; *Paspalum distichum*, sets only; *Paspalum* - species unknown, sets only; *Lippia* (species) a hardy, low-growing, rapid spreading, non-edible plant, sets only; *Andropogon annulatus* (Angleton grass) sets only; and others of lesser importance. Several species new to the region are being tried out to determine their adaptability. The Bureau of Plant Industry is cooperating in this work.

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BY WAY *of* BIOGRAPHY

H. H. BENNETT

Director

born on a North Carolina Piedmont cotton farm in 1881.....it was on this farm that he was first introduced to the problem of erosion.....at the age of nine he helped his father lay off terrace lines along the contours of slopes by



digging a hole with a hoe at the lower end of an old-fashioned wooden horse..... however, it wasn't until after he had graduated from the University of North Carolina and had spent several years in the Soil Survey of the Department of Agriculture that Mr. Bennett really began to study this problem.....it was he who first developed a national plan for measuring the destructiveness of the evil under varying conditions of soil, slope and climate and for working out practical measures of control applicable to the various soils and cropping practices of the nation.....studied in great detail the soils of the United States, Alaska, Central and South America and Cuba....devoted more study to the problem of erosion

than any other man in the country.....selected for the task of organizing and carrying forward the most comprehensive program of erosion control ever attempted in the history of the country.....large, affable, sincere, really beloved.....

GENERAL POLICIES OF GULLY CONTROL IN THE SALT CREEK WATERSHED

Because gullies are spectacular exhibits of the results of soil washing they often receive attention which should be directed to the much greater damage done by sheet erosion. Gullies are a serious menace but there can be little hope for reclaiming many areas that are badly gullied without tremendous cost. The justification for controlling gully erosion is the possibility of maintaining or increasing the productiveness of the land. The job should be a demonstration of *what can be done by the average farmer*. Structures must be of simple design and the cost in keeping with the benefits derived from their construction. In determining value of structures consideration should be given to their durability. Materials should be as nearly as possible confined to those which are found in the locality. In planning gully control work with structures, the future use of the land and the ultimate control methods should be kept in mind.

Gully control methods are to be employed on three different classes of land: crop land, pasture land, and land to be reforested. One of the important needs of this area is the maintenance of productive crop land. Where structures can be put in that will offer permanent protection to crop land it is justifiable to go to considerable expense. In pasture land vegetative cover should be utilized to the fullest extent for permanent control and structures should be used only as an aid to the establishment of vegetative control. On land where trees are to be planted structures should be of the temporary type and the amount of labor and material kept to a minimum.

Where the ultimate control of the gully is to be accomplished through the use of grass, shrubs, trees or other vegetative cover, such points as rapidity with which vegetation can become established, necessity of temporary structures to establish vegetation and time necessary for structures to hold before vegetation can take its place should be considered. In addition the relationship between the cost of construction, establishment of vegetation and the benefits to be derived must be taken into account.

GENERAL TYPES OF STRUCTURES TO BE RECOMMENDED:

Crop Land. On small drainage areas where slopes are steep or on larger drainage areas with relatively flat slopes, inexpensive structures can be used to temporarily control erosion until permanent sod strips can be established. Sod bags, small wire dams, slab dams, diversion ditches, wide check devices to spread the water, brush, litter, etc., should be used in general for this type of work. Where the quantity of water on the slope will not permit such simple check devices, the more permanent types of dams built from rock or logs may be justified.

In some cases, soil saving dams may be recommended where there is considerable pondage created above the dam and there are gullies eating back into cultivated land. In some cases the pond may be used temporarily as a stock reservoir.

Pasture Land. On small drainage areas, temporary check devices similar to those recommended on crop land should be used. On larger drainage areas the more permanent types of structures may be used, providing the value of the land will justify them. In some cases on pasture land it may be necessary to

fence off the gullies and to depend largely on vegetative cover as the ultimate control measure supplemented by temporary dams. Often satisfactory control measures can be employed by depending upon the use of vegetation, using diversion ditches near the heads of the gullies.

Land to be Reforested. Structures are to be used only when it is felt that the trees alone cannot prevent erosion. Where the drainage area is small (less than three acres) a few temporary dams spaced at strategic points in the gully are justified to temporarily control erosion until the trees get a chance to take root. On the larger drainage areas where trees or other vegetative cover cannot control erosion effectively, it may be advisable to divert additional water into a main gully which would justify the expense of installing some type of permanent structure.

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BRANCH *of* ENGINEERING

OFFICIAL NOTICE

All projects are requested to note carefully a memorandum to Regional Directors concerning the policy of the Soil Erosion Service on terracing procedure and equipment. Please apply the policy to your particular conditions, taking especial care to estimate carefully the area suitable for terracing, and make requisitions for equipment accordingly.

Occasion is taken to offer a word of explanation regarding procedure in submitting gully control and terracing report forms. A number of projects have written in asking if uncompleted work should be reported. It should not, with the following exception:

If terraces are completed and terrace outlets are not, or vice versa, then either may be reported and a notation made in the column in which the uncompleted work will later be reported, to the effect that this part of the work is not yet complete. If this procedure is followed the acreage is shown only with the first report. This results in securing an accurate average cost per acre. Later work such as planting, repairs or maintenance may be included in more than one report.

These are engineering reports and only work directed by the engineering branch should be included. A note should be made if this includes planting.

Under the column "*Bank Sloping*" include all work done for bank protection of any nature whatever.

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BRANCH *of* AGRONOMY

The Branch of Agronomy reports that during the last three months almost two and one-half million pounds of seed have been purchased for the various soil erosion projects. These purchases cover 32 different kinds of seeds which are to be used for strip-cropping and cover crops and include over 12,000 bushels of grains. Most of this seed has or soon will be sown this fall and winter to prevent erosion during the winter and spring months. The total amount of seed purchased this year amounts to almost four million pounds and an additional million and a quarter pounds was obtained from the Federal Surplus Relief Corporation, making a grand total of five-and-a-quarter million pounds.

Of the seeds purchased this fall, Hairy Vetch leads in quantity with almost one-half million pounds, and Austin Winter Peas is second with one-quarter million pounds. Two hundred thousand pounds of Timothy, 132 thousand pounds of alfalfa, and 126 thousand pounds of Red Clover have been purchased during the last three months. Over four thousand bushels of barley, three thousand bushels of rye, and oats, and a thousand bushels of wheat are also among the fall purchases.

The Bureau of Agricultural Economics reports that there is a real shortage of some seeds and short crops of nearly all of the important field seeds. For instance, the crop of Timothy is just one-fifth of last year's small crop, Alfalfa 25% smaller, Sweet Clover 15% to 25% smaller, and Red Clover 40% smaller than last year. This situation has caused a rapid rise in prices. Prices between July 1st and October 1st have risen as follows:

<i>Timothy</i>	.11 to .21
<i>Alfalfa</i>	.16 to .22½
<i>Orchard Grass</i>	.09 to .17
<i>Sweet Clover</i>	.05 to .08
<i>Red Clover</i>	.15 to .24½

In years of short crops the supply of seeds of high quality is always limited and it is advisable to purchase needed supplies early before all of the better lots are sold. Seeds which are to be purchased for use next spring should be ordered as soon as possible.

Arnold S. Dahl,
Associate Agronomist.

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Glenn L. Fuller, Chief Soil Expert, was confined to his home with a severe illness for a week this month. Dr. W. C. Lowdermilk, Vice-Director, pinch-hit for Mr. Fuller in aiding to wind up the National Resources report.

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TRAINEES ON THE NAVAJO

*by John O. Wood,
Agronomist, Navajo Project*

To attain the general objective of the Soil Erosion Service on the Navajo project it is not only necessary to demonstrate the possibility and methods of erosion control, but Navajos must also be trained to carry on the work in the future. To that end, the following procedure is used:

Young Navajos who speak English have been assigned to field men in the various divisions of the Soil Erosion Service as trainees. These young men have been selected rather carefully and in most cases have a high school education. Generally all of the trainees are above the average in native ability and were selected for the places they fill because they appeared to be adapted to take up the particular phase of work to which they were assigned.

The trainee is very valuable to the field man since he is always available as an interpreter. It is possible to get a great deal more of the kind of information sought by having a native who knows something about your work to interpret and ask questions pertaining to the specific problem. Many contacts are also made with non-English speaking Navajos through the trainee which would otherwise be impossible. In field work where laborers are being used who do not speak your language, the trainee is able to explain details, which is decidedly to your advantage.

In return for his services the trainee is paid a fair wage and in addition to this he is being taught all that is possible about the particular line of work in which he is engaged. For example, the trainees in the Agronomy Division are being taught the value of vegetation in erosion control which includes the selection of proper kinds of grasses, shrubs or trees to meet different conditions and the adaptation of different plants to various soil and climatic conditions.

Instruction is also given in soil preparations, selecting crops best adapted to the particular kind of soil, rate, time and method of planting the various crops and improved tillage methods. Particular emphasis is being given to the training of these men in greater and more efficient use of flood water or crop production. They are also getting a great deal of training in actual revegetation of their land with native grasses, shrubs and trees which they help to collect and re-seed or transplant.

Trainees in other divisions of the Soil Erosion Service are getting comparable training in their respective lines of work. One very valuable feature of the training is that it is being given under actual field conditions where actual practice is dominant rather than theory, which makes any kind of instruction more effective. The training period has been too short for us to make very definite predictions at this time; however, we are expecting some worth while accomplishments as a result of the training being given these fine young men.

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To assure our success, each superior must be a teacher to his subordinates. The seemingly impossible demands of our new and difficult work will then disappear like fog in a warm air current. *And the teacher will be taught.*

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A MAJOR EFFORT AT EROSION CONTROL

Continued from Page Four

We may turn aside from the plan of attack outlined above, but eventually we shall have to come back to it, and when we come back the job will be larger and more difficult and more costly.

If we should leave out of consideration, for example, the lesson taught by nature--the fact that vegetation is the most powerful agency of erosion and flood control--we would be as guilty of neglect as the physician who would refuse to administer an anaesthetic where the life of a patient depended absolutely upon such administration. Let's not forget that over the 50 million acres of the great Piedmont area, extending from New York City into east-central Alabama, there was not so much as one acre of erosion-exposed clay, or one single erosional gully when these lands were taken over from the Indians. Now we have between 15 and 20 million acres of erosion produced relatively stiff clays and clay loams in the place of the original mellow, humus-charged loams, sandy loams and clay loams, and probably not less than 20 million gullies that were formed after the removal of the cover of vegetation. Let's not forget that stand of virgin timber by commercial forest-destroyers who have skimmed the cream of the regional resources and left to the people of these sections, in many instances, not so much as a dollar's worth in the way of improvement, but rather millions of dollars of outright loss in wrecked forests and devastated land, the result of erosion which such wreckage fosters.

WORKING TOGETHER

It should be obvious to any one that in order to make any headway along permanent lines of erosion control it is going to be vitally necessary for the Soil Erosion Service to make the best possible use of its pooled resources of brains and technical information. Its specialists and all others must work together in a coordinated plan of land protection and soil and water conservation.

Failure to do this would result in weakening the chain in its vital link, with resultant failure. Seeing this obvious necessity, it should be perfectly clear to every man on the job that he or she has a duty to perform, a piece of work to accomplish successfully, if this most basic resource of the nation--the land--is to be conserved for our present use and for the use of those who are to come after us. It should also be obvious that not only must each individual perform his or her duty, but that it is an obligation upon each one to help his co-laborers wherever and whenever circumstances call for such assistance. Likewise it should be perfectly clear that success calls for perseverance and unwavering loyalty to the nation through the organization of the Soil Erosion Service. It is clearly the moral and patriotic obligation of every member of the organization to work according to these precepts of imperative individual responsibility, or else to move into some other field of activity where he or she can work according to the rules.

And finally, let's remember that civilizations have disappeared because of erosion--that magnificent temples are being dug from beneath the products of erosion in regions where the land is all desert or rock or incredibly poor soil. On the other hand, let's remember that the descendants of the Incas, who were cultivating the steep slopes of the Andean Mountains when the Conquistadores scaled the ramparts of Pacific South America 400 years ago, are still being cul-

tivated with methods of land use that were in operation before the time of Christ.

The above general statements outline the procedure which is essential to success in this great erosion program undertaken by the Soil Erosion Service. If we fail in carrying out these things, then the program fails.

But we shall not fail; we shall move ahead, constantly improving our methods, weeding out dead timber as soon as signs of decay are revealed, ever pushing forward along lines of proven correct procedure, cooperating closely with those who can help us. We must all recognize that we are not fighting for ourselves but for the lands of a great nation. We are not merely crusaders, but soldiers on the firing line defending the vital substance of our homeland.

Let me urge with deepest earnestness that each of us, regardless of any circumstance except bodily disability, contribute his ultimate best to this cause. This, let me assure you, will mean success, and in success we shall all be happy. It will not be forgotten that we were the shock troops.

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OHIO CAMP GIVEN HONOR RATING

Company 1527, Camp SES-2A, at Sonora, Ohio, one of the CCC camps now engaged in erosion control work on the Zanesville project, has been designated as an "honor" camp for the month of July, according to word just received by Regional Director J. S. Cutler.

As pointed out by J. G. Lindley, Supervising Engineer of the ECW camps under the Soil Erosion Service, such a distinction is quite an honor inasmuch as only one "honor camp" is selected in each district.

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DISTINGUISHED BRITISH SCIENTIST VISITS COON CREEK

Recently the Coon Creek project was host to Dr. R. MacLagan Gorrie, of the British Forest Service. Dr. Gorrie has worked for a number of years in Punjab, India, with headquarters at Lahore. He is now in this country on a Leverhulme grant to study erosion and grazing in relation to forestry and watershed protection. He is accompanied by Mrs. Gorrie.

The Coon Creekers were so delighted with the Scotch brogue and charming personality of this couple that they almost lost sight of the fact that they had in their midst a scientist of distinction.

Dr. Gorrie also spent several days at the Washington office, and will visit a number of other projects this fall and winter.

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WHAT IS A SOIL SURVEY?

What is a soil survey? Here's how William DeYoung, Soils Expert on the Bethany, Mo., project, answers that question.

"A soil survey is essentially an inventory of the soil resources of any particular area. It is a fundamental investigation of our soil resources on which all systems of agriculture must be based. It corresponds to the work of the Geological Survey which investigates the mineral and oil resources. The

aim or purpose of the Soil Survey is to determine the character and extent of the various kinds of soil, knowledge of which will enable the Soil Erosion Service to point the way toward a better utilization of the land."

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THE ADDRESS OF BIG CHIEF GULLY

It is the sad duty of the Committee of Gullies to report that since the last annual meeting of the Gullies, Chief Big Gully has passed on. This loss is a severe blow to our organization at this time when we have a new enemy, the S.E.S., to combat.

The Committee urges each individual gully to make every effort to establish a progress record for the year. By united efforts we may be able to discourage this new enemy. A new "Chief" will be elected at the next annual meeting.

By order of the Committee of Gullies:

Fellow Gullies! It is with a heavy heart that I bring you this message. I have deeply appreciated the honor that you have bestowed upon me for the past decade. Some of our young members who are quite good sized today have been born during my time of office. I realize that I am aged; that my efforts have become more feeble with each of the passing years. My sides are heavily grown with brush and grass, my lower limbs are desecrated with trees and even my head and upper limbs are now becoming clogged with small brush and grass. I know my life is nearly run. I do not wish sympathy or pity. My life has been full. I have ruined 4 acres of land; I have killed 2 horses and 4 cows. Is there one among you who has done as much? But I have made my mistakes and it is of these I wish to speak. I will speak briefly of our allies and at length of our enemies. I hope especially that our younger members will heed some of the warnings that I will give.

It is proper that first I should classify our enemies and allies. Our first ally is runoff. Any method of cultivating land which will increase runoff is therefore an ally. Our enemies are all types of vegetation, contour cultivation, terraces, strip cropping, or anything that will reduce runoff or cover the soil so that it washes less readily. Now we have the activities of man as both an ally and an enemy. We must, however, class man as an ally. The history of our race shows that we follow man and his activities. We have never gained a strong grip on any country without man. Thus we must classify him as our ally.

A special type of man has been visiting us recently. He is from the S. E. S. The Soil Erosion Service, fellow members, is an organization of trained men that would introduce, to his brother and our ally, means of cultivation and cropping practices that would wipe us from the face of the earth. Our only hope is that men who have been our allies for generations will not desert us now. If they do, I see the doom of our race. Do not become too alarmed at this new menace. There are doings of man that we will never understand. Although man, our ally, and man, our enemy are brothers they often act as enemies. Man our ally is distrustful of man our enemy. Therein lies the hope of our posterity.

So much for man. Now let me warn you against the neglect of cancerous growths of grass, shrubs, trees, yes, and even weeds. They may seem unimportant at the time but if let alone they will grow on you until they begin to catch soil that you are trying to throw away. As they catch soil they catch seeds and before long your system will become clogged. I know that often our ally, a big

heavy rain will come to your assistance and put you back in good condition again. But,, don't depend upon it. I did, and three times it repaired the damage dueto my negligence, but the heavy rain did not come the fourth time until it was too late. That was five years ago, but my death started then, and was due to my carelessness. I should have caved off those clumps of grass and small brushes. I didn't though. I laughed at them; I wanted them to get a little larger before I destroyed them. I even forgot them for a period and when I again remembered it was too late. But even in my death struggles it is with pride I view my torturous length and great depth. I will die knowing that what I have destroyed will never be tillable again.

Enough of warnings. In closing let me say I am proud of our record in this community. The tabulated record of the year's program is not at hand but within my memory we have ruined 1,000 acres of good land, killed 37 head of livestock, and generally depreciated the value of all the farms on which we live. It is a record of which to be proud. Thank you!

-- Harvey G. Bobst
Asst. Agr. Engr
Nebraska project.

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THE TECHNIQUE OF OBSERVING AERIAL PHOTOGRAPHS

by Charles K. Collier

Many users of aerial photographs, even those of long experience, frequently have difficulty in clearly reading aerial photographs because of the fact that the valleys have a tendency to appear as ridges and ridges to appear as valleys. This optical illusion is caused by the fact that the photographs are taken from such a high altitude that all effect of perspective is lost and also because the average person is not fully familiar with the appearance of the earth from the air. Another element which aids in creating this optical illusion is that our eyes have become conditioned to shadows cast by light originating in the sky, or, in any event, from above our heads. For this reason, for example, a projection from a wall which casts a shadow below it, has the appearance of a projection rather than a depression. If the shadow were cast upwards, the tendency would be to interpret the projection as a depression, particularly if one were to look at it through one eye so as to eliminate stereoscopic vision.

In the same way, if a photograph is held so that the shadows of elevations are cast towards the observer, such elevations will generally appear to be elevations. If, on the other hand, the photograph is turned around so that the shadows of elevations are cast away from the observer, or cast upwards if the photograph is being held in a vertical position, elevations will frequently appear to be depressions and streams will seem to be running on top of ridges.

The moral of the above analysis is obvious: when examining aerial photographs, hold them so that the shadows cast by trees or houses or land elevations are thrown towards the observer, or, if the photograph is held vertically so that they are thrown downwards as though cast by a light originating in the sky.

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The drafting department, of which little is heard, occupies quite an important niche in the Soil Erosion Service. Under the direction of W. F. Beamon, Chief Draftsman, a great many activities are carried on. Chief of these are the preparation of area, state and national maps, for varied purposes connected with the activities of the Service; charts and drawings for illustrated pamphlets and other publications; design of emblems and insignia and assembling and filing various map data and aerial photos of regional areas. At the present time, the drafting department is temporarily employing a force of approximately 40 men in preparation of a national erosion map. After this map is completed it is expected that additional men will be added to the regular staff of five to prepare a more comprehensive national map delineating in addition to erosion, soil types, vegetative cover and slope range.

EDITOR'S NOTE: In connection with the drafting room department, it is quite apropos to pay tribute to the cover design artist, Miss Elizabeth Osgood.



Miss Osgood

In addition to the cover work, Miss Osgood has spent quite a few hours with speedball and art gum in the preparation of designs, headings, and other work essential to the planning and promulgation of this magazine. Also we acknowledge work of Mrs. Danforth, who is responsible for the caricatures which appear on this page and others that will be reproduced in subsequent issues.

The drafting room believes that coordination of work and inter-employee harmony can be expedited by congenial enjoyment after office hours. Accordingly on Tuesday night, October 2, the personnel of the National Resources division of the Soil Erosion Service drafting department staged a party at one of Washington's night clubs --- in celebration of their first pay day. Here we have an eye witness report:

It was pay day at the office
And the draftsmen all were there
Awaiting their checks for salaries,
Of their patience was worn bare.

For many weeks they'd waited,
And Beamon leased them dough.
To keep them all from starving
Their cash was worse than low.

Now rose "Sus" Pence among us,
He said, "We'll celebrate.
We'll have a little party,
We'll dine and dance 'til late.

.....

And now they're all arriving
By two and three and four,
Until there were assembled
Full thirty odd or more.

The gang was now assembled—
Each seated in his place.
When up arose our Beamon,
A smile upon his face.

We toasted then unto his health
Alas his wife, so fair
We toasted loud, we toasted long—
They are a splendid pair.

Then up 'rised Cousin Clarence,
And grabbed himself a girl,
He took her on the dance floor,
And there began a whirl.

Of course there was Boss Beamon,
And Beamon's bone was there.
And seated close upon their left
"Zack", I do declare.

Ann was there, and so was "Books",
Miss Yaler, also Wright....
Pence danced in with Margaret,
It was a merry night.

Smith came early, brought a girl,
"Little Sticks" was there,
Armstrong danced with Campbell,
And Dorris danced with Meagher.

And there was "Arizona"
Norcross, Easter too,
You say we had a good time?
Well, I'll agree with you.

Levi, Woodson, and Osgood,
Jehler, also Sage,
Olson and Muldowney...
bet some gal got a hug...

And thus we dined and danced
Good fellowship did reign,
And everyone enjoyed the night,
....Next day was a pain.

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THE DISINTERESTED OBSERVER

The Press and the Public
speaks its mind about the S.E.S.

Mr. Frank Eohn, in TODAY of October 2:

"It was the enthusiasm of the men in the field that led me to search out the commandant at Washington. His name is H. H. Bennett, and his vigor, enthusiasm, and industry account, I believe, for much of the activity of his forces on the job.

"To early training, education and experience, Mr. Bennett adds the fire of a missionary's zeal in his cause."

Mr. Owen P. White, in COLLIER'S of September 29:

"...And if the energy and enthusiasm with which the Soil Erosion Service has tackled its job can be made to count for all it should, we are not going to do anything like that.

"As a rule, government services are slow to take their feet off their desks and when they do, as a general thing, they move reluctantly about. The men in the Soil Erosion Service, however, who are now at work in twenty-four different stations in the country educating farmers are not like that. On the contrary they constitute about the liveliest gang I ever met, which I think can be accounted for by the fact that Mr. H. H. Bennett, the director of the service, has instilled into every one of his young men the idea that the job he is on is of even more importance to the future welfare of this country than that of a congressman."

*Editorial in the LA CROSSE TRIBUNE AND LEADER-PRESS,
La Crosse, Wisconsin, September 22:*

"Few men in charge of federal projects in the series that has come and gone under the present administration have displayed such enveloping interest in their work as have these soil erosion technicians. They have fused their knowledge with the problems of the farmer in such a way that co-operation with the plan has been more spontaneous than had been hoped for in the beginning."

*Editorial in the FORT WORTH STAR TELEGRAM, Fort Worth,
Texas, September 13:*

"In the development of the program to prevent soil erosion, which is one of the most constructive projects of the Administration at Washington and is winning widespread farmer cooperation....."

Editorial in the BOSTON TRANSCRIPT, Boston, Sept. 10:

"There is one PWA project that deserves from every American the most resolute and far-reaching support. With \$10,000,000 allotted from the Public Works fund, the Department of the Interior is fighting to save millions of acres of this nation's arable land from destruction.

"No such effort can be too great, if under the supervision of competent specialists.... Upon the outcome of this campaign there depends the whole future, and to a far greater extent than most people realize, the present welfare of American civilization."

Editorial in the SAN ANTONIO EXPRESS, San Antonio, Texas, August 30:

"As the soil is one of the most valuable assets which the country possesses, no phase of President Roosevelt's 'national economy' program is more important than planned use of the land."

Editorial in the ATLANTA JOURNAL, Atlanta, Georgia, August 29:

"A service more essential to America's fundamental industry can scarcely be imagined.... But at last this all-important work has begun in earnest and effectively. It means a new day of security and prosperity in the country at large..."

Letter from Mr. J. E. NOLL, Bethany, Mo., October 10:

"The citizens of North Missouri appreciate the splendid soil erosion and flood control work being done by the U. S. Department of Interior, through the Soil Erosion Service in the Big Creek demonstration area.

"There is no question in my mind, but that agriculture will derive more lasting benefit from this work than from all other methods and plans being undertaken by the Government..."

"I am handling 69 farms in Harrison County, Missouri, containing 15,092 acres, 6 farms in Kansas containing 3800 acres, and without question the greatest problem that confronts me in handling this land is how to operate at a profit and at the same time not lose the top fertile soil."

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TEXANS STUDY EFFECT OF EROSION ON COTTON

All cotton ginned at twelve of the gins within the Temple, Texas watershed is being classed and graded by a specialist from the Bureau of Agricultural Economics. The project staff is thus enabled to make a study of the effect of erosion and erosion control methods on grade and staple of cotton.

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CONTRACT RAMBLINGS

A humorous outline explaining the necessary steps in putting a contract through the mill. It was written by Shane MacCarthy, Contract Clerk, who we suspect had a few impatient Chief Clerks in mind.

A special research bureau has been working steadily since the advent of the Soil Erosion Service, diving into the annals of antiquity trying to unearth the Goddess of Contracts. From unpublished information we have just learned by rumor that her habitat is the planet "Impatience", and her name is Addico, which her father, the god named "Rush" gave her, deriving said cognomen from the first two letters of each of the words Advertisements, Bids, and Contracts.

Under the ever watchful eye of Addico, the Advertisement is born, and grows through the "bidding" years of puberty until it is married by the contracting officer to "Award" and under the married name "Contract" lives through its allotted span of life. Could an advertisement talk, we might hear this conversation:-

Chief Clerk: "I think you are now ready to leave on life's journey."
Advertisement: "Listen, dumb egg, please put on my 'Compliance-paper' vest before I venture out."
Chief Clerk: "There you are. Thank heaven I won't see you for 10 days. Goodbye."
Advertisement: "You think you're clever, eh! Bet you don't even know my component parts."

The Advertisement goes to the bidder:

Bidder: "Who on earth fixed you up this way?"
Advertisement: "That sap, the Chief Cluck, and his assistants."
Bidder: "You don't look so bad to me so I guess I'll tattoo you a little with figures."
Advertisement: "O. K., but you have not yet signed my Compliance."
Bidder: "All these darn Compliances give me a code-in-the nose. Do you get it? Now you're like a mature individual. Sleep in this envelope for a few days until your Chief Clerk friend opens you and smiles graciously at the marks I put on you."

Advertisement sleeps placidly for a few days, until the shrouds are ripped and he is face to face with the Chief Clerk.

Advertisement: "Hello, here I am, a mature individual. Now look me over."
Chief Clerk: "You look horrible. I must see some of your incoming companions."

The Chief Clerk looks at the others and in disgusted fashion comes back to poor Advertisement, looks at him, writes a letter to Washington and like an old-fashioned match-maker recommends the marriage of Advertisement to Award. Advertisement, along with the other eligible suitors, is shipped to Washington. The Contract Section in Washington sees them and notes that the Chief Clerk has said "Please Rush". So Advertisement and companions are relayed to the Purchasing Office. In the Purchasing Office the eligibility of the various suitors is fully tested. During this period the eligibility of checked while the "Rushers" in the field are sending letters, telegrams, etc., asking for the marriage date. Eventually, Advertisement is hooked up with Award. The union is unique in that a new name is adopted -- "Contract", and the result is many necessary items are born to supply the needs of our workers.

Just another contractual marriage. The Goddess Adbico smiles on.

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DROUGHT WORKS BOTH WAYS IN KANSAS

*by F. L. Duley
Regional Director*

The drought in this region during the past summer was the most severe on record. This has worked both to the advantage and disadvantage of operations on this project. There has been so little rain that we have had few opportunities to demonstrate the value of the different phases of our program. Some rains have fallen recently which have shown very forcibly the value of contour planting of row crops even though the crop itself had made very little growth. The contoured fields showed water standing during the rains along each row, the soil absorbing the water, with little or no runoff taking place. Some of the brush dams and other types of dams have had no chance until recently to catch sediment, but have proven very satisfactory in practically all cases so far. In some instances considerable fills have been made. Trees planted during the spring started in good shape, but the prolonged drought and intense heat killed most of them although some have come through in a fairly satisfactory manner. The dry weather has also prevented the seeding of erosion control crops such as grass, alfalfa and sweet clover. The readjustment of our cropping systems will, therefore, really not begin until the spring of 1935.

On the other hand, we have been able to take advantage of the dry weather and the AAA program, due to the fact that there has been unused land available all summer on which we could work. We moved onto the contracted acreage to do terracing after the farmers planted much of their land to corn. In June it was evident that the small grain crop had failed and many farmers permitted us to go through their wheat and oats fields because their crops were not worth saving. Following this, the complete corn failure enabled us to go into corn fields and build terraces and other structures in July and thereafter, whereas, if a good corn crop had been produced, it would have delayed our work until October or later.

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